AUXILIARY INPUTS (SOLAR AND WOOD BOILERS) (Part 1 of 2) DHW-4

Project Title _____ Date _____

Notes: This sheet must also be submitted with a DHW-1 water heating worksheet. Detailed instructions for calculating Active Solar Credit, Passive Solar Credit or Wood Stove Boiler Credit are contained in Section 6.3 of the *Residential Manual*.

Active Solar Credit

1. Solar Energy Credit =
(Solar Fraction) × (line 1a - line 1b, from DHW-1) × (0.80) = _____

Active Solar Credit Notes: In equation 1, Solar Fraction = "FDHW" from F-Chart. F-Chart parameters are fixed as listed in Table 6-8. Enter Line 1 on DHW-1, Line 1c.

Passive Solar Credit

2. Calculate temperature difference from SRCC data:

T_{SRCC} = $[Q_{SAV}/(100\ gal/day \times 8.25\ Btu/gal\text{-}°F)]$ + $[Q_{CAP}/(V_t \times 8.25\ Btu/gal\text{-}°F)]$ = _____

Where: Q_{SAV} (Btu/day) = from SRCC test results
Q_{CAP} (Btu) = from SRCC test results
V_t (gal) = total volume of solar storage tank

3. Calculate energy losses during SRCC test:

$Q_{LOSS,SRCC} = T_{SRCC} \times 16\ hr/day \times L\ Btu/hr\text{-}°F$ = _____

Where: 16 = number of hours system is losing heat
L (Heat Loss Coefficient, Btu/hr-°F from SRCC test results)

4. Calculate energy collected during the SRCC test:

$Q_{TOTAL,SRCC} = Q_{SAV} + Q_{LOSS,SRCC}$ = _____

5. Adjust energy collected to climate zone insolation values (see Table 6-9)

$Q_{TOTAL,LOCAL} = 1204 + [(Q_{TOTAL,SRCC} - 1204)/1500] \times CZ\ insolation$ = _____

6. Determine $T_{TANK,LOCAL}$, average tank temperature delivered to the site:

$T_{TANK,LOCAL} = (A_1 + A_2 + Q_{TOTAL,LOCAL}) / (A_3 + A_4)$ = _____

Where: A_1 = (50 gal/day) x (8.25 Btu/gal-°F) x (CZ Water Main Temp)
A_2 = 16 hrs/day x L x (CZ Ambient Air Temp)
A_3 = (50 gal/day) x (8.25 Btu/gal-°F)
A_4 = 16 hrs/day x L
CZ Water Main Temp and CZ Ambient Air Temp from Table 6-10

7. Determine energy losses at the site:

$Q_{LOSS,\ LOCAL} = L \times 16\ hrs \times (T_{TANK,\ LOCAL} - CZ\ Ambient\ Air\ Temp)$ = _____

Project Title _____ Date _____

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Passive Solar Credit (cont.)

8. Determine energy used by electric resistance freeze protection devices:

   ERP = (Freeze days/yr + 4) x (Collector Area) x
   (0.5 kBtu /ft^2 -freeze day) = _____

   This is calculated only if the system uses electric resistance freeze protection.

9. Calculate system total annual energy contribution (mmBtu/yr); Enter on DHW-1, Line 1c:

   $\{(Q_{TOTAL, LOCAL} - Q_{LOSS, LOCAL}) \times 0.365 - ERP\} \times 0.001 \times$
   (No. of Dwelling Units) = _____

The credit calculated cannot exceed the larger of DHW-1, Line 1a - Line 1b or 3 mmBtu/yr.

Wood Stove Boiler Credit

10. Wood Stove Boiler Credit:
    (Basic Energy Use) × (Credit Factor) = _____
    DHW-1, Line 2a From Table 6-12

Table 1: Energy Used by Freeze Protection Devices

Climate Zone	Freeze Degree Hours[1]	Climate Zone	Freeze Degree Hours[1]
1	44	9	1
2	624	10	57
3	3	11	417
4	157	12	324
5	74	13	195
6	0	14	2813
7	0	15	28
8	1	16	8152-26153[2]

1. Freeze Degree Hours is defined as the annual sum-mation of hours that dry bulb temperature is less than or equal to 34° F from midnight to 10 am and from 6 pm to midnight.
2. The lower limit is for Mt. Shasta (3535' elevation) and the upper limit is for Tahoe City (6,230' elevation).

NOTE: Data in this table is used in item 8 of DWH-4 (Part 2 of 2).